

NOTES FROM THE OHIO STATE HERBARIUM. III.

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THE GENUS *BIDENS* IN OHIO. The species of the genus as represented in Ohio fall naturally into four well distinguished groups, the first including the simple leaved forms with or without rays, the second the rayless species with divided leaves, the third the *Coreopsis*-like species with conspicuous rays, and the fourth the single species *Bidens bipinnata*, distinguished by its linear achenes and dissected leaves. The latter is our only representative of the section *Psilocarpae* of DeCandolle; the others with flat achenes belong to the section *Platycarpae*.

The species of the northeastern United States have been confused in the recent floras, and this has led to a misunderstanding of the local forms. The keys and descriptions in this paper include only the Ohio species, and it is hoped that they will be of service to Ohio botanists in studying this interesting genus of Composites.

A number of species now included in *Bidens* are in Gray's Manual and other earlier works referred to *Coreopsis*. Dr. Britton (Bull. Torr. Club 20:280, 281. 1893.) first pointed out their closer relationship with *Bidens*, including in that genus all forms with a pappus of upwardly or downwardly barbed awns, and limiting *Coreopsis* to those species in which the pappus consists of two short teeth, a mere border, or is entirely absent. The aquatic species known as *Bidens beckii* differs in many significant features from typical *Bidens*, and has been proposed by Professor E. L. Greene as the type of the new genus *Megalodonta*. The name of the Ohio species becomes accordingly *Megalodonta beckii* (Torr.) Greene.

The most important recent literature on the genus is by K. M. Wiegand (Bull. Torr. Club 26:399-422. 1899.), who gives keys and full descriptions of most of the species of *Platycarpae*, and by E. L. Greene (Pittonia 4:242-284. 1901.), who discusses the nomenclatorial history of the genus and describes many new species.

KEY TO THE OHIO SPECIES.

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| 1. Achenes linear, not flattened. (PSILOCARPAE DC.) | 1. <i>B. bipinnata</i> . |
| 1. Achenes cuneate to obovate, flattened. (PLATYCARPAE DC.) | 2. |
| 2. Leaves simple, serrate or somewhat pinnatifid. | 3. |
| 2. Leaves pinnately parted or compound. | 6. |
| 3. Heads nodding on erect peduncles after flowering. | 4. |
| 3. Heads persistently erect. | 5. |
| 4. Leaves oblong, 6-10 cm. long, little or not at all narrowed at the base. | 2. <i>B. cernua</i> . |
| 4. Leaves elliptical, 10-18 cm. long, narrowed at the base. | 3. <i>B. elliptica</i> . |
| 5. Outer bracts scarcely exceeding the disk, not more than 15 mm. long. | 4. <i>B. connata</i> . |

5. Some of the outer bracts twice as long as the disk or longer, the longest 20-75 mm. long. 5. *B. comosa*.
6. Rays none or very short. 7.
6. Rays large and conspicuous, bright yellow. 8.
7. Outer involucre bracts 4, achenes about 5 mm. long. 6. *B. discoidea*.
7. Outer bracts 6-8, achenes 6-8 mm. long. 7. *B. frondosa*.
7. Outer bracts 10-16, achenes 7-10 mm. long. 8. *B. vulgata*.
8. Achenes cuneate, the short awns narrowly triangular, upwardly hispid. 9. *B. trichosperma*.
8. Achenes cuneate to obovate, the slender awns two-thirds the length of the achene or more, barbed. 10. *B. aristosa*.

1. *Bidens bipinnata* L. Stem much branched, 3-8 dm. high. Leaves slender petioled, ovate, 1-3-pinnately parted, segments ovate, deeply toothed or lobed. Heads long peduncled, 10-20-flowered, involucre oblong, 7-10 mm. high; achenes linear, four-sided, narrowed above, 7-15 mm. long, exclusive of the usually four downwardly barbed awns.

In shaded places throughout the state.

2. *Bidens cernua* L. Stem sparingly branching above or sometimes from the base, 2.5-4.5 dm. high. Leaves oblong, about 1 cm. wide, acuminate, finely and regularly serrate except at the apex and base, cordate-clasping or connate. Heads few to several, erect in flower, nodding in fruit, about 8 mm. high, outer bracts equalling or exceeding the disk; achenes four-angled, cuneate, 4-5 mm. long, awns four, 2-3 mm. long, retrorsely barbed.

Specimens are in the State Herbarium from Cuyahoga, Geauga, Lucas, Madison, Mercer, Perry and Wayne Counties.

3. ***Bidens elliptica***. (Wiegand). *Bidens cernua elliptica* Wiegand, Bull. Torr. Club 26:417. 1899. Stem erect, usually freely branching above or sometimes from the base, 3-8 dm. high. Leaves elliptical, typically 12-15 cm. long by 2-3 cm. wide, sharply serrate along the middle, long acuminate and conspicuously narrowed toward the sessile or barely connate base. Heads very numerous, nodding in fruit, outer bracts exceeding the disk, ray flowers usually present and conspicuous; achenes cuneate, 5-6 mm. long, awns four, retrorsely barbed.

Abundant in wet places along streams, apparently throughout the state.

Bidens elliptica is one of the commonest members of the genus occurring in Ohio. However, it has never before been definitely reported from the state, probably because it is not described in the current manuals, where it is included under *Bidens cernua*. When its identity has been recognized it has been frequently confused with *Bidens laevis*, a coastal plain species with persistently erect heads, not found farther inland than central New York. Although originally described by Wiegand as a variety of *Bidens cernua*, its stouter and branching habit, the numerous heads, the brighter green and larger leaves with

their characteristic elliptical shape and tapering base easily distinguish it from that species and warrant its elevation to specific rank.

4. *Bidens connata* Muhl. Stem erect, branching above, 4-10 dm. high. Leaves lanceolate, sharply serrate, long acuminate at base and apex. Heads numerous, about 6 mm. high, rays none; outer bracts of the involucre about 5, 1-1.5 times as long as the disk, lanceolate-oblong, entire or minutely toothed; corollas 5-lobed; achenes cuneate, 5 mm. long, awns 2 mm. long, retrorsely barbed.

There is but one specimen in the State Herbarium, from Wyandot County.

5. *Bidens comosa* (Gray) Wiegand. Stem diffusely branching from the base, or with short branches above, 2-7 dm. high. Leaves elliptic, lanceolate, or narrowly ovate-lanceolate, coarsely toothed, acute or acuminate, tapering at the base into a winged petiole. Heads usually numerous, about 1 cm. high in flower, in fruit becoming 2 cm. high and 3 cm. in diameter, outer bracts 6-8, oblong to oblanceolate, foliaceous, serrate, twice as long as the disk or longer and reaching a length of 8 cm.; corollas 4-lobed; achenes 7-10 mm. long, awns three, the longest 4-6 mm.

Abundant in wet places, probably throughout.

6. *Bidens discoidea* (T. & G.) Britton. Stem freely branched, 5-15 dm. high. Leaves 3-divided, on slender petioles, leaflets lanceolate or narrowly ovate-lanceolate, sharply serrate, acute at the base, long acuminate at the apex. Heads numerous, 5 mm. high in flower, outer bracts 4, narrowly spatulate, exceeding the disk; achenes cuneate, about 5 mm. long, the two awns about 2 mm. in length.

One specimen from Cedar Point, Erie County.

7. *Bidens frondosa* L. Sparingly branched with spreading branches, 6-10 dm. high. Leaves 3-divided, usually thin, on slender petioles 3-5 cm. long, leaflets ovate-lanceolate, acute or rounded at the base, acute or short-acuminate at the apex, 5-8 cm. long. Heads relatively few, 5 mm. high in flower, much larger in fruit, outer bracts 6-8, narrowly spatulate, conspicuously exceeding the disk, naked or sparingly ciliate at the base; achenes oblong or cuneate, dark brown to black, 6-8 mm. long, awns two, 4 mm. long.

The three specimens in the State Herbarium, from Holmes, Meigs and Vinton counties, have been confused with *Bidens discoidea*. The two species are at once separated by the more numerous outer bracts and the much larger achenes of *Bidens frondosa*, as well as by the laxer habit of branching in the latter species. According to Wiegand the leaves are sometimes 5-divided, but this was not observed in any Ohio specimens.

8. *Bidens vulgata* Greene. Stem stout, erect and branching, 5–16 dm. high. Leaves pinnately 3–5-divided, on long petioles, leaflets lanceolate, acuminate, coarsely and sharply serrate or almost incised, 5–12 cm. long. Heads comparatively few, mostly on long stout peduncles, the largest becoming 2 cm. high and 3 cm. across in fruit, outer bracts 10–16, spatulate oblong, unequal and conspicuously exceeding the disk, ciliate at base; achenes brown, obovate, flat, 7–10 mm. long, the two awns 4–6 mm. long.

Abundant in moist soil throughout the state. It has long been confused with *Bidens frondosa*, and under that name has been included in Gray's Manual and the Illustrated Flora. It is distinguished from *Bidens frondosa* by the larger heads, the coarser leaves, the more ascending branches, and the large broad achenes. The bracts, which are ciliate in *Bidens vulgata*, may possibly serve also as a distinguishing character.

9. *Bidens trichosperma* (Michx.) Britton. Tall and freely branched above in the usual form, although in peat bogs it may bloom when but 2–3 dm. high. Leaves petioled, 1–2-pinnately parted, segments 3–10, narrowly linear-lanceolate or linear, acuminate at base and apex, sharply serrate along the middle or almost entire. Heads numerous and showy, outer bracts linear-spatulate, about equalling the disk; achenes cuneate, 5–6 mm. long, awns 2–3 mm. long, narrowly triangular, upwardly hispid or becoming smooth.

Throughout the state, except possibly the extreme southern part, but especially common at the north. Widely variable in size and especially in the shape of the leaf-segments, which in specimens from peat-bogs are sometimes linear-spatulate, entire and rounded at the apex. From this extreme there is every gradation to the typical linear-lanceolate shape. The variety *tenuiloba* has been reported from the state and is undoubtedly included in the preceding description, but there is no valid reason for separating two forms in the Ohio material at hand.

10. *Bidens aristosa* (Michx.) Britton. Stems erect, freely branching, 4–10 dm. high. Leaves petioled, pinnately divided, segments 3–7, lanceolate, sharply serrate, acuminate at both ends. Heads very numerous, with conspicuous rays, outer bracts oblong or oblong-spatulate, equalling or shorter than the disk; achenes broadly obovate, 4 mm. long, with two slender barbed awns 3–4 mm. long.

This western species has so far been reported only from the western part of the state. Three specimens are in the State Herbarium, from Champaign, Clark, and Madison Counties. Although in general habit it resembles *Bidens trichosperma*, it is easily and certainly distinguished from it by the broad achenes with their long slender awns.